



Biology Toolkit: Indicator 3.4.1

Student Handout: Biology: Indicator 3.4.1

Goal 3.0 Concepts Of Biology

Expectation 3.4 The student will explain the mechanism of evolutionary change.

Indicator 3.4.1 The student will explain how new traits may result from new combinations of existing genes or from mutations of genes in reproductive cells within a population.

Assessment Limits:

natural selection (definition; effects of environmental pressure)

adaptations (effects on survival)

variation (effects on survival and reproductive success)

Public Release - Selected Response Item - Released in 2009

Biology Indicator 3.4.1

Use the information and the drawing below to answer the following item.

The desert climate is caused by geographic conditions such as location, high atmospheric pressure, and proximity of mountain ranges. Average desert rainfall amounts are usually less than 50 cm per year. Soil in deserts is coarse, sandy, and rocky. Desert plants and animals have specialized characteristics that help them survive in the harsh environment. An example is the Saguaro cactus. The Saguaro has a shallow root system with a main taproot and other roots that radiate out and collect surface water. The trunk of the Saguaro has the ability to expand while storing water. The sweet-nectar flowers of the Saguaro attract white-winged doves, bats, and other animals. These animals feed on the nectar. They are necessary for cross-pollination. Cross-pollination occurs when the pollen of a flower is carried to a flower on another plant. The illustration below shows the Saguaro cactus.

Which advantage is the most likely result of cross-pollination to Saguaro cacti?

- A. disease resistance
- B. variation within the species
- C. larger cacti offspring in each generation
- D. increased number of animals that drink nectar

Correct Answer

B. variation within the species

Item

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